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## PROVIDING TRAFFIC WARNINGS TO A USER BASED ON RETURN JOURNEY

### FIELD

The present disclosure relates generally to navigation systems. More particularly, the present disclosure relates to generating route information that accounts for aspects of a return journey route.

### BACKGROUND

Various navigation systems provide users with turn-by-turn directions. These systems can include handheld GPS devices or mobile phones, vehicle-mounted devices, or Internet-based computers with access to a mapping application. Users input one or more locations and receive a route and turn-by-turn directions. Generally, these systems can select a fastest route based on the shortest estimated time to travel along the route. Some systems can incorporate traffic conditions, for example reports of congestion, into this calculation. Some systems can provide route information including an estimated travel time to the one or more locations.

A user can evaluate the information provided by a navigation system and/or mapping application for planning purposes. For example, route information that includes an estimated travel time to a destination location can help a user plan a departure time. More particularly, a user can select a local grocery store as a destination location to see the estimated travel time to the grocery store with live traffic information taken into account. In some instances, a user might make decisions about a desired destination based on this navigational information.

### SUMMARY

Aspects and advantages of embodiments of the present disclosure will be set forth in part in the following description, or can be learned from the description, or can be learned through practice of the embodiments.

One example aspect of the present disclosure is directed to a computer-implemented method. The method includes obtaining, by one or more computing devices, a request for navigational directions to a target destination. The method also includes determining, by the one or more computing devices, an outbound journey route from an initial location to the target destination, wherein the outbound journey route includes an estimated outbound journey time. The method also includes determining, by the one or more computing devices, a return journey route from the target destination to a return destination, wherein the return journey route includes an estimated return journey time. The method also includes comparing, by the one or more computing devices, the estimated outbound journey time to the estimated return journey time. The method also includes generating, by the one or more computing devices, a notification regarding the return journey route when comparing the estimated outbound journey time to the estimated return journey time results in a determination that one or more predetermined criteria are met.

Another example aspect of the present disclosure is directed to a user computing device. The user computing device includes a display device, one or more processors, and at least one tangible, non-transitory computer-readable medium that stores instructions that, when executed by the one or more processors, cause the user computing device to

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perform operations. The operations include receiving a request for navigational directions to a target destination. The operations also include initiating determination of an estimated outbound journey time to travel from an initial location to the target destination and an estimated return journey time to travel from the target destination to a return destination. The estimated outbound journey time and the estimated return journey time are determined at least in part from one or more of current traffic conditions or historical traffic conditions. The operations also include receiving a notification regarding the return journey time when a comparison of the estimated outbound journey time to the estimated return journey time results in a determination that one or more predetermined criteria are met. The operations also include providing the notification for display on the display device.

Another example aspect of the present disclosure is directed to one or more tangible, non-transitory computer-readable media storing computer executable instructions that when executed by one or more processors cause the one or more processors to perform operations. The operations include obtaining a request for navigational directions to a target destination. The operations include determining an outbound journey route from an initial location to the target destination, wherein the outbound journey route includes an estimated outbound journey time. Determining the outbound journey route is based at least in part on one or more of current traffic conditions or historical traffic conditions. The operations also include determining an estimated destination time indicative of an estimated amount of time a user will spend at the target destination. The operations also include determining a return journey route from the target destination to a return destination, wherein the return journey route includes an estimated return journey time that is determined at least in part from one or more of current traffic conditions or historical traffic conditions for a return start time determined from the estimated outbound journey time and the estimated destination time. The operations also include comparing the estimated outbound journey time to the estimated return journey time. The operations also include generating a notification regarding the return journey route when comparing the estimated outbound journey time to the estimated return journey time results in a determination that one or more predetermined criteria are met.

Other aspects of the present disclosure are directed to various systems, apparatuses, computer program products, non-transitory computer-readable media, user interfaces, and electronic devices.

These and other features, aspects, and advantages of various embodiments of the present disclosure will become better understood with reference to the following description and appended claims. The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate example embodiments of the present disclosure and, together with the description, serve to explain the related principles.

### BRIEF DESCRIPTION OF THE DRAWINGS

Detailed discussion of embodiments directed to one of ordinary skill in the art is set forth in the specification, which makes reference to the appended figures, in which:

FIG. 1 depicts a block diagram of an example computing system according to example embodiments of the present disclosure;